

Some Notes on Blanford's, or the Whitetailed Wood, Rat [*Rattus blanfordi* (Thomas)] in western India

BY

A. BROSSET

(With one plate and one text-figure)

Amongst the rodents, the genus *Rattus* is the best studied. The urban species, the Black Rat [*R. rattus* (Linn.)] and the Brown Rat [*R. norvegicus* (Berkenhout)] have been the subject of many works concerning their behaviour, their *psychic-faculties*, their reproduction, . . . etc., and their biology is very well known today.

In India, from the ecological point of view, we find two groups of rats, one associated with man, as *R. rattus* and *R. norvegicus*, and a second which shows no tendency to have anything in common with man, as Blanford's, or the Whitetailed Wood, Rat [*R. blanfordi* (Thomas)]. It would be interesting to compare the various other aspects of the lives of these two ecologically segregated groups.

Cohabitation with man has deeply modified the biology of the first group, and it is in the second group, which has undergone evolution free from human influences, that we must search for the primitive and natural biological characters of the *Rattus* stock.

For useful comparisons between these two ecologically segregated groups of *Rattus*, it is necessary to know the biology of both. But, though we know very well the biology of the town-rats, unfortunately nothing seems known about the others. The reason of this ignorance is easy to understand. In addition to the scarcity of field-mammalogists in India, these rodents are hill and forest species, living in secluded places. Like all small nocturnal mammals, they are usually extremely difficult to observe in their natural biotope.

During 1959 and 1960, I have made zoological researches on the fauna of the caves in western India, and have had the opportunity to observe several Blanford's Rats in their native haunts, and to collect some data on their life histories. Certain aspects of their biology, such as food and nocturnal territory, remain unknown, but

I have collected details about their diurnal biotope, social life, breeding behaviour, etc., and these observations, together with some comparisons with the biology of the town-rats, are the subject of the present note

CIRCUMSTANCES IN WHICH BLANFORD'S RATS WERE SEEN

Twenty-six rats were observed in their natural haunts. In all cases these rodents were in the darker, quieter, and most secluded parts of Buddhist caves all in hilly country.

Bedsar Caves (Western Ghats, Poona District):

On 4th June 1960, in a dungeon adjacent to one of the principal caves, my attention was drawn to a crevice in the wall, from which a strong smell of rodent-urine was emanating. Inside, five Blanford's Rats, a pair of adults and three young ones, were squatting. The rodents were on bare stone, and there was no trace of a nest. To catch them, we smoked out the rats with sulphur for a long time before we succeeded.

Aurangabad Caves, Deccan:

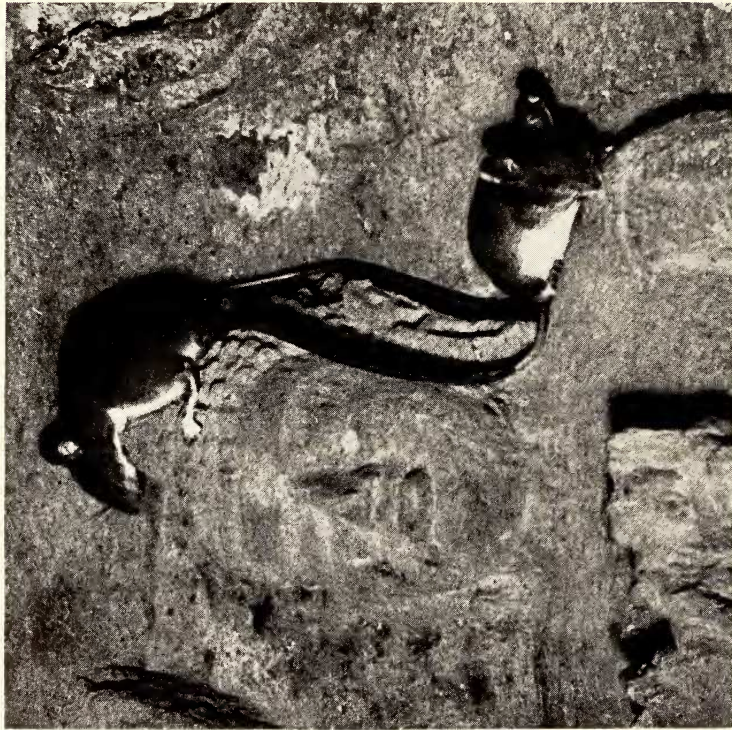
I paid a visit to the caves early in the night of the 28th August 1960, wishing to observe the nocturnal behaviour of the bats living there. About one hour after sunset, in a dungeon adjacent to one of the caves, I saw two sub-adult *R. blanfordi*. In the dungeon there was also a small colony of Indian Vampire Bats, *Megaderma lyra*. Rats and bats were very active, and seemed ready to go out of the caves, which they did immediately after my intrusion.

Half an hour later, in one of the open caves, I met a third Blanford's Rat. This rodent was sick, and probably blind. His eyes were covered with a whitish disc. Half the body was denuded of hair, and it was very thin.

Kanheri Caves (Salsette Island, Greater Bombay):

It was here that I was able to follow the life of several individuals. In fact, I have visited these caves regularly, on an average once in every month since August 1959 to January 1961. During the last monsoon, I visited these caves at least once a week, and often twice or more. Although the subject of my researches was the biology of bats, I took notes also of what I saw about Blanford's Rats.

Blanford's Rat, *Rattus blanfordi* (Thomas)



Two *R. blanfordi* in their haunt



At the nest, female and young.

R. blanfordi appear in the Kanheri Caves immediately after the beginning of the monsoon. Before the rains, when I visited the caves, not one was visible. But, on the 18th of June 1960, 16 Blanford's Rats had taken up residence in different places. The majority remained there till the end of the monsoon in September. Two families remained up to the 13th November, after which all disappeared completely.

In June, I noticed 5 pairs and 6 isolated individuals. Two or three of the latter were half grown. Afterwards, we saw in other caves three more pairs. Most of them were in niches excavated in stone walls, but a few were just resting on the shoulders or the head of the Buddhas carved in the rock. The rats were naturally tame, and did not fear very much the approach of humans. One could observe, photograph, and even lightly touch them without prompting this amiable animal to bite or to escape. It was also noticeable that this species is not a repugnant mammal, as *R. norvegicus*. Its appearance and disposition helped my observations.

In the course of my visits in June and July, I had the opportunity to follow the life of a family, from the birth of the young ones to their dispersal. We made notes on the growth of the young ones and behaviour of the parents. These observations were continued in September and October, the animals having been marked—the marking was done on the tail with mercurochrome.

The synthesis of my notes on *R. blanfordi* could be placed as follows:

- (1) Ecology (diurnal biotope)
- (2) Social life (inter- and intra-specific associations)
- (3) Reproduction (the nest and the young)

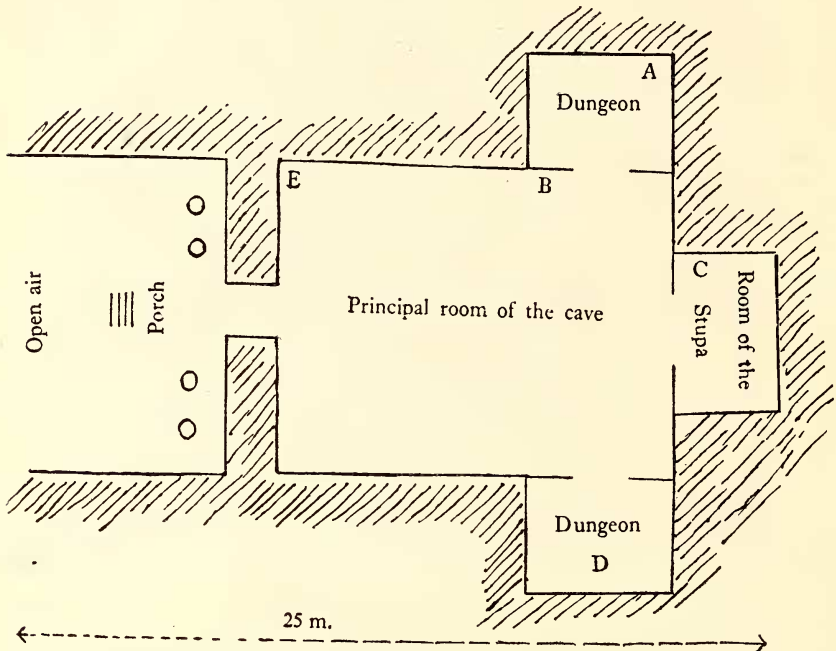
ECOLOGY

The caves are a seasonal haunt, inhabited specially during the monsoon. During the dry season these rodents probably live in crevices of rocks, under stones, and in hollows of trees.

The caves selected by the rats were situated in hilly country, far from human activity. The Kanheri Caves which are daily visited by a number of people during the dry seasons, are very quiet and deserted during the monsoon.

Blanford's Rats were always found in the darkest and most secluded parts of the caves, sometimes in crevices in rocks as in Bedsar, but most often in small niches in the walls. Seldom do

they lie on the ground. Small dungeons adjacent to the principal caves are most often chosen as a haunt (see text-figure).



Plan of Buddhist cave with its fauna of vertebrates during the monsoon (Kanheri, 18th June 1960)

A : Nest of Blanford's Rat—1 female and 3 young ; B : Toad, *Bufo melanostictus*, moulting ; C : Place of male Blanford's Rat ; D : Haunt of 18 Bats *Megaderma spasma* ; E : Place of a pair of large geckos, *Hemidactylus maculatus*.

Blanford's Rat is a nocturnal animal, and leaves the caves a long time after sunset. During the day, it usually refuses to go into the open air, even if disturbed by man.

I had the opportunity to observe the start of a family for the nocturnal trip on the 20th of July after sunset. I believe that it was the first outing of the young. Thirty-five minutes after the beginning of the night, the three young ones appeared at the door of the cave. They made a very slow and careful exploration of the porch. After about ten minutes of hesitation, suddenly, they rushed into the open and disappeared in the tall grass of the hill.

About a quarter of an hour later, the parents appeared in their turn in the porch and left the cave.

On our next visit, three days later, the pair of adults were there. But the young ones definitely abandoned their parents.

SOCIAL LIFE

Blanford's Rat is a sociable species, although isolated individuals are not rare (6 cases observed). The group is a family association: a pair of adults with or without young.

During about 45 days after their birth, the young ones depend on the parents. In certain cases, as in Kanheri, they dispersed immediately after weaning. But in Bedsar three young about 2½ months old were still living with the parents.

The observations are in conformity with what we know of the social life of the other *Rattus* species associated with man, *R. rattus* and *R. norvegicus*. For both, the social group is a family one. If food is plenty, the young remain in the family group. If food is scarce they leave the native biotope after weaning.

The Buddhist caves of Bombay State give refuge not only to Blanford's Rats, but also to many other vertebrates, such as mice and rats of different species, squirrels, bats, geckos, toads, etc. One can notice that there is no inter-specific association amongst rodents in the cavities; the presence of other rats or mice excludes that of *R. blanfordi*. So, at the beginning of the rains, when a lot of different rodents took shelter in the Kanheri Caves, individuals of a single species were always seen in each cave. But Blanford's Rats tolerate very well bats and toads in their haunts. So, in several caves, I saw toads, *Bufo melanostictus*, in the immediate proximity of Blanford's Rats. These toads come here during the monsoon, for their moult, probably needing relatively dry air for this operation. It is strange to see the toad taking off his skin with the help of his legs and mouth, and gradually eating the removed skin. I observed such an individual very busy in this work, while in the same dungeon, a female Blanford's Rat was suckling her young.

The association of the rat with bats in the same caves is common. I saw species of bats, such as *Hipposideros galeritus*, *Taphozous melanopogon* and *kachhensis*, and *Megaderma lyra*, cohabiting with Blanford's Rat. In a cave at Kanheri a colony of the rare bat *Megaderma spasma* lived in good understanding with five *R. blanfordi*, two adults and three young. Curiously enough the *Megaderma* or False Vampire bats are known as eaters of small rodents. But, in the present case, these ferocious Chiroptera did not attack the rats, even the young ones during the first period of their life. Perhaps like many other raptors the bats have a zone of protection in the immediate vicinity of their haunt. In any case we can consider the association of rats with bats as a testimony of their mutual sympathy.

These associations are only phenomena of convergence, which bring together in the same biotope different mammals having the same ecological requirements.

REPRODUCTION

I was lucky enough to follow in good condition the reproduction of a couple, in June, in Kanheri Caves. The female was marked and had a second litter at the beginning of the autumn. I saw also two other cases of reproduction, in Bedsar and Kanheri Caves. I give the relevant particulars in the table below:

Bedsar	Kanheri : Pair No. 1		Kanheri : Pair No.2
	First Litter	Second Litter	
Young probably $2\frac{1}{2}$ months old on 4th June 1960	Young 6-8 days old on 18th June 1960	Young about 50 days old on 13th November 1960	2 Young about 50 days old on 13th November 1960
Date of birth (estimated): about 20th March	Date of birth (estimated): 10th June	Date of birth (estimated): 1st October	Date of birth (estimated): 1st October

The observations are not very significant about the periodicity of reproduction. In fact, though we always saw young ones more or less grown amongst these rats, the greater number of pairs were without young ones, and nothing is known about reproduction in winter. It is a fact that reproduction in the well-known species *R. rattus* and *R. norvegicus* is primarily dependent on the quantity of food, and has no special season. Probably, the reproduction of *R. blanfordi* has no periodicity, and can take place at any time.

We saw in Kanheri Caves that $3\frac{1}{2}$ months separated the second litter from the first. But this observation is perhaps also not significant, for in the species of the *Rattus* genus the frequency of the broods seems to be a function of the availability of food.

SIZE OF LITTER

We found as follows :

Bedsar	.. 3 young.
Kanheri:	
1st couple	.. 3 young (first litter)
	.. 2 young (second litter)
2nd couple	.. 2 young